F1005

LIFE HISTORY AND STOCK COMPOSITION OF STEELHEAD TROUT IN THE LOWER YUBA RIVER

Submitted by:
Yuba County Water Agency

II. Executive Summary

b. Project Description and Primary Biological/Ecological Objectives. The purpose of this study is to address the basic need for information on the life history and stock composition (i.e., contributions of hatchery and wild fish) of steelhead trout to support ecosystem restoration and species recovery programs under the Ecosystem Restoration Program Plan (ERPP), the federal Endangered Species Act (ESA), the Anadromous Fisheries Restoration Program (AFRP), and California's Anadromous Fisheries Program Act of 1988. The primary objectives of the study are to 1) use scale characteristics to assess the population and life-history characteristics (e.g., age structure, length of freshwater residence) of Yuba River steelhead, 2) estimate the contributions of hatchery and wild steelhead to Yuba River runs, and 3) evaluate the utility of scale characteristics as a tool for distinguishing between hatchery and wild Central Valley steelhead.

c. Approach/Tasks/Schedule. Adult steelhead will be trapped in the north fish ladder at Daguerre Point Dam. Lengths and weights will be measured, any external tags or marks will be noted, and scale and tissue samples will be collected from individual fish. An effort will be made to trap adult steelhead throughout the year (subject to actual run timing and trapping conditions) and in sufficient numbers to accurately assess life history variation and stock composition of Yuba River steelhead. Scale analysis will be performed to determine the age, life-history pattern, and origin of individual steelhead. Reference scale collections will be obtained from known wild and hatchery sources. Scale characteristics identified by other researchers as important variables for discriminating hatchery and wild steelhead stocks, and other characteristics that may be identified during this study, will be evaluated to determine their reliability for discriminating between wild and hatchery steelhead among Yuba River samples. Genetic analyses will be used to complement and evaluate the utility of scale characteristics as a tool for distinguishing hatchery and wild steelhead.

The study would be conducted over a 3-year period. Work products would include a field and laboratory manual, quarterly progress reports, and a final report with appendices and data summaries. The appendices will include a report from J. L Nielsen, U. S. Forest Service (USFS), regarding the results of the genetic analyses.

d. Justification for Project and Funding by CALFED. This study is directed specifically at steelhead trout, an ERPP priority species, and ERPP's stated need for additional research to address the large deficiencies in information regarding steelhead freshwater and ocean life history, behavior, habitat requirements, and other aspects of steelhead biology. The information generated by this study, in conjunction with other proposed research and monitoring of steelhead in the lower Yuba River, will support the CALFED Bay-Delta Program's (CALFED's) ERPP restoration objectives of steelhead (CALFED Programmatic Environmental Impact Statement/Environmental Impact Report [EIS/EIR] Technical Appendix, Volume 1, Page 160) by identifying important life-history strategies and associated habitat needs of steelhead in the lower

Yuba River, facilitating future assessment and monitoring of natural steelhead production (i.e., distinguishing hatchery from wild fish), and implementing broader ecosystem restoration actions that are consistent with the life-history and ecological needs of steelhead. This information has also been identified as important to the success of other federal and state steelhead recovery and management programs, including the ESA, AFRP, and California's Anadromous Fisheries Program Act of 1988.

e. Budget Costs and Third-Party Impacts. The total requested budget from CALFED is $239,584. Yuba County Water Agency (YCWA) will provide $60,000 of the total study cost of $299,584. There are no third-party impacts associated with the study.

f. Applicant Qualifications. Yuba County Water Agency (YCWA) has taken an active role in fisheries monitoring, protection, and enhancement on the lower Yuba River since 1990 through the implementation of flow and water temperature control measures, funding of fisheries monitoring programs and assessments, and participation in fisheries restoration planning efforts currently being undertaken by the Yuba River Fisheries Technical Working Group (YCWA, U.S. Fish and Wildlife Service [FWS], National Marine Fisheries Service [NMFS], California Department of Fish and Game [DFG], and several local interests). YCWA proposes to use Jones & Stokes Associates (JSA) to coordinate, direct, and implement the proposed project. The JSA fisheries and aquatic ecology team has extensive technical, analytical, and field experience related to Central Valley fisheries, with major strengths in anadromous fish ecology, life history, and biology in the Yuba River. JSA has been YCWA's primary fisheries consultant since 1990 and has conducted numerous fisheries field investigations, monitoring, and assessments of lower Yuba River fisheries resources. Dr. J. L. Nielsen, a fisheries research scientist with the USFS Pacific Southwest Research Station, has conducted numerous investigations into the genetic relationships of steelhead and rainbow trout in California.

g. Monitoring and Data Evaluation. The proposed sampling program is designed to obtain sufficient numbers of steelhead over the annual migration period to define the range of life history patterns of Yuba River steelhead; provide sufficient statistical power to distinguish between different stocks; and determine the relative abundance of steelhead of different ages, life history patterns, and origins. Single- and multivariate statistical procedures (e.g., analysis of variance/covariance, discriminant analysis) will be used to evaluate differences in measured scale parameters and other variables (e.g., length-weight relationships) between different stocks, and to select the variable or set of variables with the greatest discriminatory power.

h. Local Support/Coordination with Other Programs/Compatibility with CALFED Objectives. As the applicant, YCWA provides the necessary local agency involvement to maintain local support. Coordination with other agencies and monitoring programs will be necessary for successful implementation of this project. Scale reference collections will be needed from various ongoing and proposed research, monitoring, salvage, and hatchery programs. Planning and design of the fish trap and associated facilities will need to be coordinated with the U.S. Army Corps of Engineers' (ACOE's) and FWS's current planning efforts to improve fish passage at Daguerre Point Dam. The project will make substantial progress toward implementing CALFED's ERPP vision and will contribute to key provisions of the AFRP and DFG's Steelhead Restoration and Management Plan for California.